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1

Separate jets direct the flame toward the bottom of the iron, thus insuring the most efficient utilization of the heat.

2

This method of flame direction prevents the flame from rising up and out at the top to burn the clothes, thus eliminating the fire hazard.

3

Perfect combustion results in an entire lack of odor.

4

Two separate jets direct heat into the points of iron, insuring even and continued heat.

5

Both ends of the Imperial are pointed, a feature which saves the housewife's strength and time.

6

The IMPERIAL is guaranteed not to backfire.

7

Every Imperial is equipped with a regulator.

IMPERIAL GAS IRONS

Quick and frequent sales with splendid profit to the gas company result from a practical demonstration of the IMPERIAL GAS IRON. The endorsement of the housewives of the country over, has resulted in the sale of over two and one-half millions of Imperials. The unerring judgment of the womenfolk who use and recommend IMPERIAL GAS IRONS is due to the features enumerated above and which are found *only on Imperials.*

Let us tell you of our special merchandising plans.

GENERAL SPECIALTY CO.

455 11th Avenue, New York City

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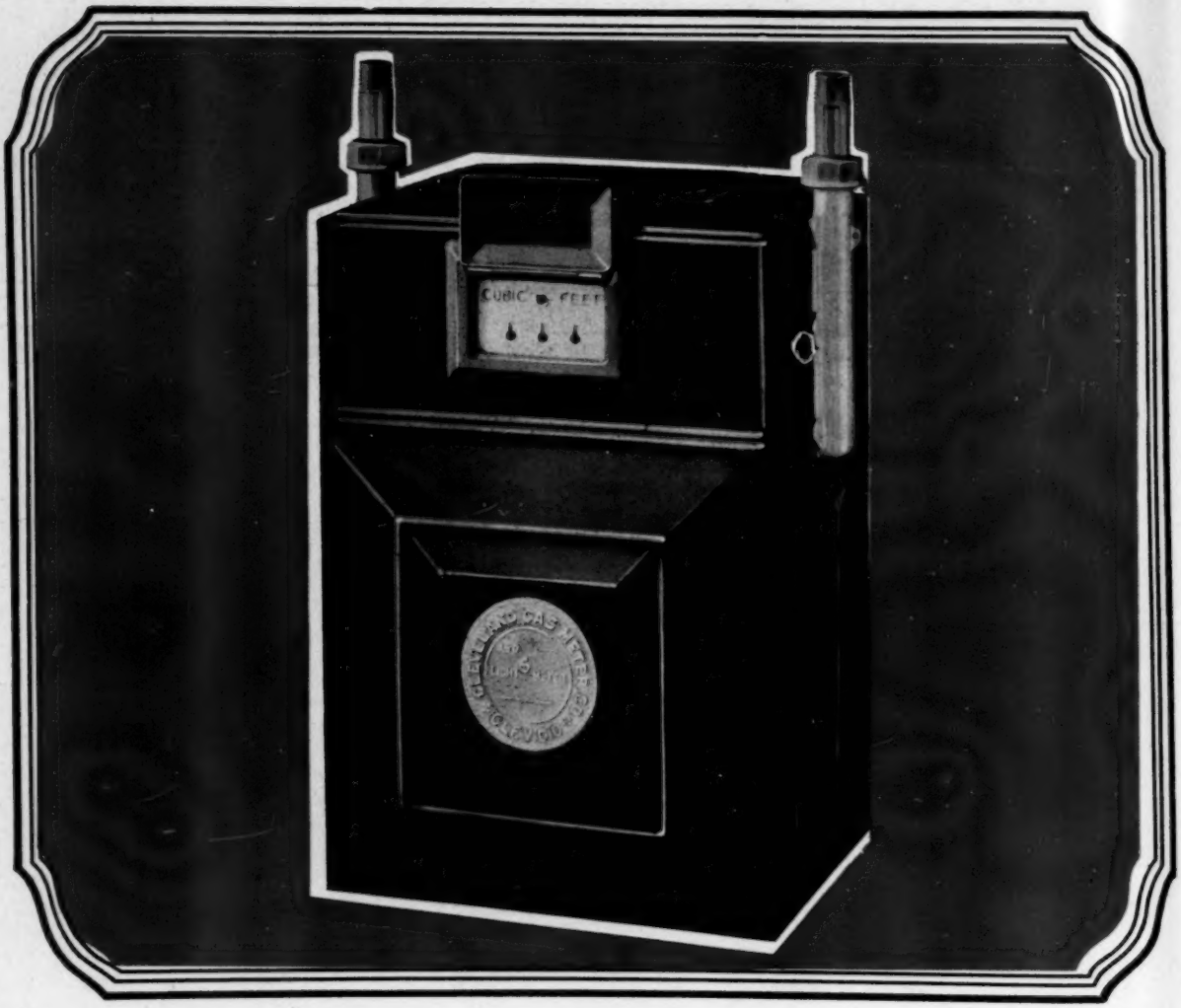

Dependability in a gas meter means a constant measure of reliable service; this is appreciated by the Superintendent, the Meter-reader and the Consumer.

Cleveland Gas Meters have a reputation for dependable service, the result of over thirty years' experience in manufacturing.

Our thoroughly organized and completely equipped factory assure you that the workmanship, materials, accuracy and general efficiency are unequaled.

"A" and "B" Types Meter Repairing

CLEVELAND GAS METER COMPANY

2180 East 65th Street **Cleveland, Ohio**

P. F. McENANEY, 85 Hancock St., Brooklyn, N. Y., Eastern Representative

AMERICAN
GAS JOURNAL

Vol. 121. No. 3 NEW YORK, JULY 19, 1924 Whole No. 3471

Customer Ownership in the United States

What it means, what it has accomplished, and why it should be encouraged

Frank LeRoy Blanchard

Advertising Manager, Henry L. Doherty & CC., New York.

Customer ownership is one of the most important movements in the public utility field today. It is potent with all kinds of possibilities, and is important not only from the standpoint of the utility, but also from the investor, the customer of the gas company.

The article which follows was presented before the Public Utilities Advertising Association on July 15, 1924, at the convention of the Associated Advertising Clubs of the World, held in London, England.

IN THE United States and Canada the growth of the gas, electric light and power, water and street railway industries during the past decade has been one of the wonders of the industrial age in which we live. When we consider that for five of these years the world was disrupted by a devastating war and millions of men were withdrawn from peaceful pursuits to fight the common enemy, we are astonished at the speed with which the business interests of the several countries most seriously affected adjusted themselves to changed conditions and trade advanced to new levels.

The customers of gas companies in 1921 aggregated 9,291,000 and the population served was 47,700,000. The gross income of the manufactured gas companies in 1921 was $379,263,044; in 1922, $406,000,000; and in 1923, $429,200,000.

Capitalization of Public Utilities

It is only when we have examined statements showing the capitalization of public utility companies in America that we get a comprehensive idea of their commercial importance. According to figures submitted by experts, the cash investment in existing companies is as follows:

Electric light and power	$ 5,800,000,000
Street and interurban railways	5,000,000,000
Gas, natural and manufactured	4,000,000,000
Telephone and telegraph	2,000,000,000
Total	$16,800,000,000

This vast aggregation of capital has not been obtained solely from the millionaire class, but from banks, trust companies and other financial institutions; from business and social associations, trade unions and other organizations having surplus funds to invest; from individual men and women of wealth; and, in a large part, from the frugal wage earners of America.

Although money is money, no matter where it comes from, the organizers and managers of public utility enterprises have recently discovered that it makes all the difference in the world whether it is obtained from a few rich men or from a large number of small investors, and especially from those to whom their service is sold. As the result of their experience they are practically of one opinion, namely, that the most helpful and, therefore, the most desirable shareholders, are their own customers.

New Capital Always Needed

The companies are in constant need of new capital for increasing the productive capacity of their plants and for lengthening their service lines. What group of people are in a better position to know the needs and opportunities of public utilities than the men and women customers who are in close contact with their business? The term customer ownership is solely applied to customers of a local public utility who have purchased its stocks or bonds.

Advantages of Customer Ownership

The advantages of customer ownership are as follows:

1—It furnishes the company a market for obtain-

ing at a minimum cost a portion of the capital required for improvements and extensions made necessary by increased demands for service.

2—It strengthens the credit position of the company. The more customers owning stock, the better informed the public will become concerning its finances and standing.

3—It stabilizes the market value of shares. It is better to have 10,000 customer-owners than 100 other owners, for the reason that while a majority of the 100 stockholders might combine over-night to manipulate the market for their individual advantage, it would be an impossibility for a majority of the 10,000 to do so.

The Investment Phase

4—It affords customers an opportunity to acquire, for cash or on the installment plan, shares in small amounts in established and prosperous enterprises, and thus encourages thrift, develops a community spirit, and makes for better citizenship by creating a higher regard for the interests of others.

5—It is a source of strength for the company. The more customer owners there are in a community the more impregnable becomes its position as a business institution.

6—It creates good will and thus contributes largely to the establishment of highly desirable public relations. If the service they receive is satisfactory and the rate they pay is reasonable, customer-owners are constant boosters of the company and its interests. They are its staunch defenders when its management or service is unjustly criticised. They often make suggestions for the improvement of the service and furnish leads for adding new names to the company's list of customers, or for the sales of additional securities to persons who are already shareholders.

A Good Will Factor

7—Customer-owners are so many radiating centers of good will for the company. They are like the leaven which the woman hid in three measures of meal till the whole was leavened. If there is need for raising the service rate in a city where customer owners are numerous, the public will not oppose the company's application to the Public Utility Commission, because it knows from facts in its possession that the company is warranted in taking the step.

Customer Ownership and Municipal Ownership

8—Another advantage of customer ownership is the influence it has in bringing about the defeat of movements designed to popularize the municipal ownership of public utilities. In a city where a fairly good distribution of the company's securities has been effected, it is almost impossible for agitators to create a popular sentiment in favor of municipal ownership. Customers who have a number of shares hidden away in safe places do not favor the proposition. They have no confidence in the ability of municipal authorities to run successfully a business that requires technical knowledge and experience of a high order. They are confident that under the administration of public office holders the expenses of operation would be so greatly increased by the employment of two men to do one man's work, that in the end rates would have to be increased or the city would have to face an annual deficit.

Progress of Customer Ownership

Perhaps you would now like to know a few facts regarding the progress of customer ownership in Canada and the United States.

In 1923, $750,000,000 were expended for utility constructions and extensions. Of this amount, $250,000,000, or 33 1-3 per cent, were raised through customer ownership activities.

The American Gas Association reports that in the last eight months of 1923, 187 gas companies and a few combined gas and electric companies sold 1,251,640 shares to 227,170 investors.

In eight years, H. M. Byllesby & Co., of Chicago, one of the leading public utility operating organizations of the United States, sold $43,000,000 of preferred stock for construction purposes to 81,000 purchasers, 43 per cent of which was derived from customer ownership sales.

Increase of Securities Sales

To show how rapidly sales to customer owners have progressed, I call your attention to the records made during the four years ending in 1923. In 1920, there were approximately $35,000,000 of public utility securities placed in the hands of customers; in 1921, $80,000,000; in 1922, $175,000,000; and in 1923, $250,000,000.

A Typical Customer Ownership Campaign

Preliminary to the description of a typical customer ownership campaign, I should like to say that Mr. Doherty as far back as 1896 conceived the idea of custmer ownership and subsequently employed it to a limited extent in Denver, Colorado; Madison, Wisconsin, and Columbus, Ohio.

The Personnel

The personnel of a customer ownership department varies in number according to the size and character of the public service organization to which it belongs. Our customer ownership department is composed of a general manager, a sales manager, a campaign manager, a special advance man who gathers information for the advertising department, and who, later, places the advertising locally and secures timely publicity; and three field managers, who in addition to other duties instruct and help employees in selling, and report facts on local conditions, to their superior, who turns them over to the advertising department.

Methods Employed

The methods employed by our company in its customer ownership campaigns can best be understood

(Continued on page 670)

Drip Oil Actionon Diaphragm Leathers*

The effect of the drip oil on the oil in the leather and the importance of this in leather treatment

T. A. Mighill

Pawtucket, R. I.

THE behavior of oil soaked leather in the presence of drip oil in the liquid and vapor states is the main purpose of this investigation, leading to a comparison between two oils as to whether preference should be given to either of the two.

The method of procedure was to determine how much of the oil could be absorbed by the leather and how much would be lost on exposure.

The saturation of the leather with the oil presented no difficulties. The loss by exposure was determined by a method suggested by the behavior of oil soaked leather on exposure.

It was noticed that the leather increased in weight when exposed to the vapor of drip oil, through absorption of the latter by the oil in the leather. On standing in the air a loss of weight occurred which was attributed to evaporation of the drip oil.

General Method of Experimentation

The general method adopted was to expose the leather, quickly weigh, let stand twenty-four hours or so, and weigh again. The difference between these two weights was assumed to be the amount of drip oil absorbed and the difference between the original and the final weight was considered to be the loss of oil from the leather.

The oils used were a mineral oil of unknown composition and an organic oil of animal and vegetable composition as follows: Almond oil, one part; sperm oil, two parts; Neatsfoot oil, three parts.

Main Purpose of These Tests

The main purpose of these tests was to show which oil would cling longest to the leathers when exposed to the action of drip oil either in a liquid or a vapor form.

It may be said that the difference between the two oils was not emphatic enough to warrant a preference for either, but some facts were brought out which are of interest and of possible value in treating diaphragm leathers.

Action of Liquid Drip Oil on Oiled Leather

The removal of oil from leather by drip oil in the liquid state was so rapid that this may be dismissed with the following:

Two pieces of leather were saturated with the respective oils and put in small dishes. Enough drip oil was added to just cover them. After leaving for an hour they were removed and weighings made.

	Mineral oil	Organic oil
Leather plus oil	4.165 gs	3.866 gs
Leather	2.327 gs	2.162 gs
Oil	1.838 gs	1.704 gs
Quick weighing	3.700 gs	3.320 gs
40 minutes	2.310 gs	2.070 gs

By comparison with the weights of the original leathers it will be seen that all the oil had been removed. Such treatment is too drastic to use for comparative tests and was abandoned without further trial. All subsequent tests were made on the effect of drip oil in the vapor state.

Apparatus for Exposing the Leathers

To secure a gas tight apparatus the following apparatus was devised. As a chamber a large erlenmeyer flask, capacity one litre, was used. The mouth of the flask was closed with a rubber stopper. Through the stopper passed two glass tubes reaching nearly to the bottom of the flask. Just below the stopper each tube was bent to conform to the flaring sides of the flask. The tubes served to hold the leathers, which were fastened on with thread, and also for inlet and outlet for the gas. One tube was open at the bottom for the gas inlet and the other closed at the bottom but provided with a hole blown in the side just under the stopper for the gas outlet. The gas entered the flask at the bottom and, passing upward, escaped at the top.

When drip oil was placed in the bottom of the flask its vapor was picked up by the gas also entering at the bottom.

In making the tests gas was passed through the several chambers in parallel at approximately the same rate. This was determined by passing the effluent gas through small wash bottles containing lubricating oil, which would not evaporate. By raising or lowering the immersion tubes the rate of flow could be controlled. These wash bottles also served the purpose of insuring that gas was actually passing through the chambers.

All joints were made tight by wiring and painting with shellac.

The leathers were in the form of trapezoids 2¼ in. and 4½ in. on the bases and 4½ in. in altitude. The area of each was about 15 square inches.

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*Abstracted from a paper read before the annual meeting of the New England Association of Gas Engineers, Boston, Mass.

Market Remains Undecided

Readjustment has forced low pressure—General Condition healthy

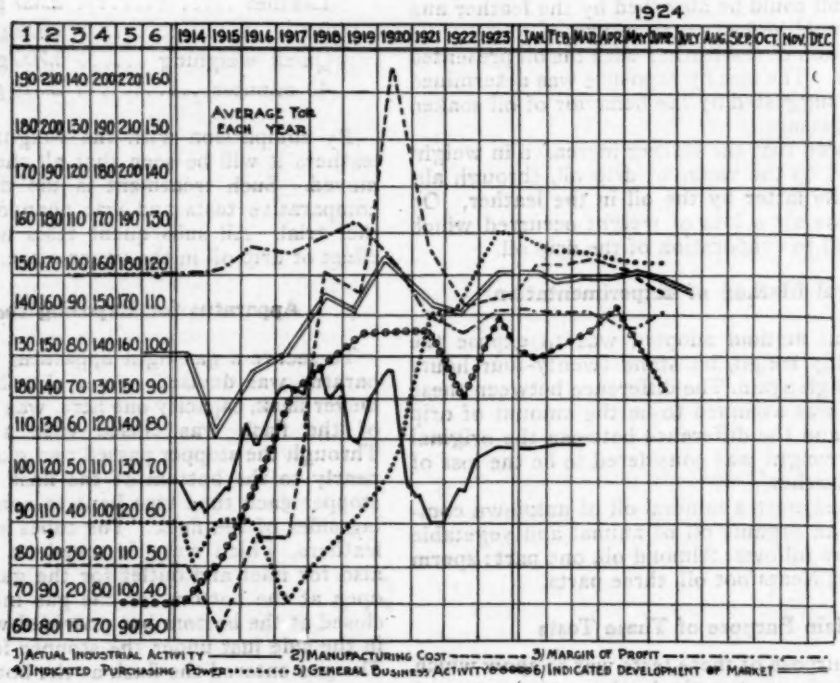
J. W. Alwyn-Schmidt

THE month of June brought no appreciable change in the market situation, which still remains unsettled, with no indication of an immediate change. The unseasonable weather was, no doubt, partly responsible for this condition, as well as the internal political condition, aggravated by the strained relations between President and Congress But the uncertainty of the tax situation has now been removed by the somewhat belated action of Congress and a considerable amount of money has been set free in this manner, which may now be spent for personal expenditures. It should help to increase the volume of retail purchases.

the last six months is ended. Retailer, jobber and manufacturer alike have come to a point where settlements can be made without danger to their credit holdings in the banks. This must have a beneficial influence upon the credit situation as it will permit the market to enter the autumn season better prepared than at the beginning of the spring season.

Six Months of General Adjustment

The last half year has no doubt been one of general adjustment, a condition which always must be accompanied by more or less violent fluctuations of the


1924
1 2 3 4 5 6
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV. DEC.
AVERAGE FOR EACH YEAR
1) ACTUAL INDUSTRIAL ACTIVITY
2) MANUFACTURING COST
3) MARGIN OF PROFIT
4) INDICATED PURCHASING POWER
5) GENERAL BUSINESS ACTIVITY
6) INDICATED DEVELOPMENT OF MARKET

But unsatisfactory as the situation appears at the present moment, there is a noticeable tendency on the part of those best able to judge, not to let themselves be driven into a state of pessimism. In fact, the market is more optimistic today than might be expected under the existing circumstances. This optimism is caused by knowledge of the security of the economic structure, and the general confidence in the soundness of business. That money is plenty and cheap and that banks are willing to come to the aid of commercial enterprises is certainly a helpful factor. The indications are that the money stringency which has been so predominant a feature in market. It is not confined to the American market alone, but also affects business, in most other markets, especially those of the leading industrial European countries, and to a lesser extent those of South America and the British Colonies. As readjustment goes on, a shifting is noticeable in the corresponding relationship of such fundamental market factors as cost of production, wages and general price situation, affecting in turn the purchasing power of the individual consumer and the monetary situation in general. Readjustment in such a case is nothing but the desire to establish a new and, if possible, permanent

(Continued on page 669)

GAS MERCHANDISING

Domestic – Industrial

Every Gas Employee a Sales Aid*

How all gas men can co-operate to increase sales

J. E. Newton

Madison Gas & Electric Company

IN PRESENTING this paper, we wish to state at the outset that we are not trying to advocate any particular plan as entirely satisfactory, but what we would like to do is to bring to your attention several points in regard to compensation to be paid employees on sales work and encouraging employees to report prospects to the commercial department. In our own particular company we have not had very much experience in working out a detailed schedule of commissions to be paid employees other than those on the regular sales force, and for this reason we have corresponded with several large utility companies throughout the country in order to get the latest information on the subject. We find in general that the utilities are not engaged in electrical or gas merchandising as a merchandising matter alone, but for the purpose of increasing the company's revenue. We are all working to increase the revenue as rapidly as we can and at the same time trying to do everything possible to increase and maintain service and to promote, improve and maintain the public good will.

"Use the User"

In my own mind, after reading all the information collected, I must confess that there is much that has been obtained from the co-operation of all employees on sales work. After all, is it not the meter man or the service man who goes into the homes and who is in a position to see what is actually needed by the housewife in the way of new or additional appliances? Is it not a fact that she takes the service man into her confidence if the service man is in earnest with his work, and how many of us employ service men who are not earnest and courteous? I venture to say that in 50 per cent of the cases, if our employees do their work well when adjusting an appliance or when installing an appliance, the customer makes some remark about some friend or acquaintance who might be interested in that same kind of an appliance. Experienced salesmen say that there is a great deal of truth in the saying, "use the user" in making sales and in securing prospects.

W. D. Jennings, sales agent, New Haven office of the General Electric Company, says that "service is salesmanship and salesmanship is service when properly applied."

Linking Together Service and Sales

I believe there is no question that sales work and service work are very closely allied and if we tie up the department concerned with these two phases of the gas business in some way, for example, having the service department hand in names of prospects to the sales department, then increased co-operation between them will be obtained.

I am reminded of the little verse on salesmanship quoted below, which contains food for thought:

Selling's not just talking
And getting folks to buy,
Leading them to want something,
Explaining how and why.
Salesmanship is more than that,
More work and more fun, too;
Service given willingly,
Hard work—a cheerful grin—
It's making friends, for that is what
Puts you in line to win!

—Commercial Reflections.

Compensating the Employee

It is a known fact that unless the company's customers are receiving the service they are entitled to the company suffers, for it is true that sales can only be made to customers who are friendly disposed. The personal contact of capable service men who understand the public and cater to its whims is conducive to more sales and greater business. We expect all this from our employees and is it not logical to believe that the employees would be in a better position to understand and appreciate the reason for it all, if they were encouraged to hand in the names of prospects and receive a reasonable commission on appliances actually sold because of their interest.

*Delivered before the annual meeting of the Wisconsin Utilities Association.

All Employees Should Co-operate

In building up an efficient personnel we believe it pays to work for the closest co-operation among all employees. When we have educational meetings for the fitters and service men, we invite the salesmen in order that the employees of both departments may have an opportunity to mingle with each other and learn the other's problems. At meetings of this kind, sales programs could be outlined in order that all the employees might be correctly informed in regard to the principal points of the sale in question.

Enlist All Employees in the Sales Campaign

Every employee should be informed of your sales and publicity plans and of the special inducements to employees. Have a general meeting and go over the details of your plans, supplying the employees with copies of your advertisements, special notices and sales talks. Cash or special premium offers could advantageously be offered to employees, other than salesmen, for the largest number of sales made to prospects whose names are turned in. A certain number of credit points could be established for each type of appliance, the winners being the employees receiving the highest number of points during each week or each month. As a stimulus to such competition, the names of employees who have turned in prospects and the number of points earned could be posted in some conspicuous place in the company offices and salesroom. If the enthusiastic support of the entire organization of a company is obtained and each and every employee is sold on the idea, they will all help to gain the desired results.

Advantages of Heads

The remark has been made that several names of prospects might be turned in which are absolutely no good and the salesman who goes out on them is only wasting time. In companies where the plan has been used this has not been the experience; in fact, they state that there is a distinct advantage in being able to put into the salesman's possession some kind of information showing that certain people, for one reason or another, have some interest in the appliance to be sold. The leads furnished the salesman help to "break the ice" when he makes the first call on the prospect.

Does Propect Getting Interfere With Regular Work?

The question that has arisen in my mind was in regard to whether the securing of prospects on the part of the employees would in any way interfere with their efficiency on their regular work. The idea, however, is to have the employee turn in the name of a prospect only and not to try to make the sale. If the employees thoroughly understand this and if the commission is not too high, I believe the results will be desirable. Of course, any plan requires supervision and it is up to the heads of the departments and the foremen to see that the men do not become lax in their regular work.

The companies who are using the plan state that, instead of interfering with the efficiency of the employees in their regular work, it makes them more efficient. The People's Gas Stores in Chicago have had a great deal of experience with securing names of prospects from all employees and they state that "so far as this special work is concerned, it cannot possibly interfere with their regular duties, inasmuch as it requires only talking to friends and acquaintances and customers with whom the employees come into contact, and ascertaining whether or not they are interested in or contemplate purchasing some kind of merchandise which we offer for sale."

Makes for Closer Knit Organization

One point which I wish to make in connection with the idea is that under whatever plan it is worked out I believe it will do one thing for the entire organization which we are all striving for, that is, to bring it closer together to form a real unit. If every employee is sold on the sales program and the appliances which are to be sold, he will take more interest in his own particular job and will actually begin to see the reason for it all. He will realize that service and good will is going to help him individually as well as the company. If you have ever had meetings of your employees for educational purposes and for discussing policies with them, you will no doubt agree that they are willing to listen and learn. If you will just tell your story to them, I am sure you both will be working for a better and larger company. In those cases where a commission or a point system has been adopted, the additional work on the merchandising department is small and there certainly is no great effort on the employee's part, and yet they both have received considerable benefit.

The System Employed

Those companies that have not worked out a schedule of commissions and points to be paid employees for handing in the names of prospects might be interested in the following routine for issuing prospects which has worked out successfully in a campaign in one of our large gas utility companies.

1. Prospects must be made in duplicate on form provided, giving all necessary information such as name, address, kind of merchandise they are interested in, etc., signing it with name of person issuing it and what department they work in (all names, addresses and department must be legible).
2. Prospect must be turned in to superintendent or supervisor of department.
3. Department superintendent or supervisor will send original and duplicate to the sales manager.
4. All prospects sent in will be turned over to outside salesmen and if they close, it entitles person issuing it to commission and points on each sales, as follows:

(Continued on page 660)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 29

Expansion Effect of Heat

COEFFICIENT OF LINEAR EXPANSION

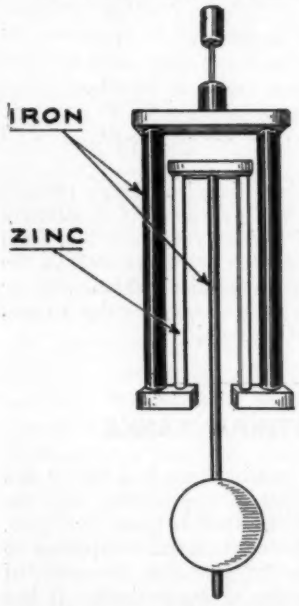
WHILE all solids expand with heat, the rate or degree of expansion, as has already been pointed out, differs. Each solid has a characteristic rate of expansion which is an inherent property of the substance. This fact makes it a difficult matter sometimes to join together different substances and to have the union remain firm and fast without injuring in any way the apparatus or device of which this is a part, or interfering with its proper functioning.

An example will illustrate the importance of this property of matter and how it may be used to advantage, as well as how it reacts at times to the disadvantage of the artisan or manufacturer who makes the article. Take the incandescent light with the carbon filament. It is necessary to lead the connecting wire through a glass part in the interior of the light. Some kind of metallic wire had to be used for this purpose, for what was required was a conductor. But this wire had to be imbedded in the glass part and it was essential that the joint between the wire and the glass should be maintained absolutely intact.

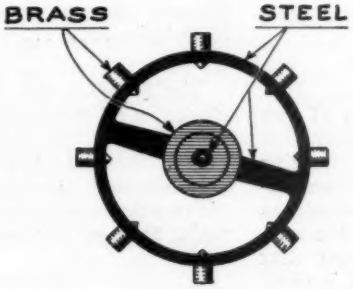
It is known that glass has a rather low rate of expansion and it is an easy matter to cause a piece of glass, of the best quality, to break, due to unequal or too rapid heating or cooling. The brittleness of glass is one of its great disadvantages and unequal strain exerted on a piece of glass is a sure and easy way of breaking it.

Hence, when the current passes through the wire

EXPANSION CAUSED BY HEAT

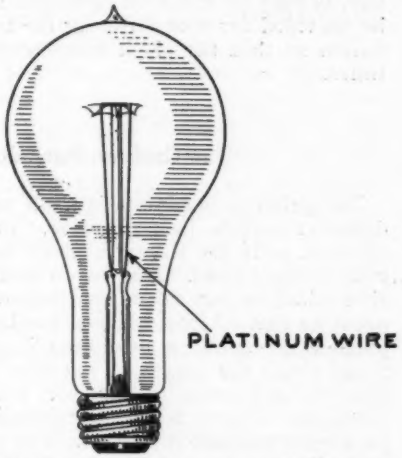


COMPENSATED GRIDIRON PENDULUM



COMPENSATED BALANCE WHEEL

Different Metals used to Compensate for Expansion by Heat



Platinum Wire used, Fused in Glass because its Coefficient of Expansion is nearest that of Glass

which is imbedded in the glass, if the heat which is produced thereby does not expand both metal wire and glass at approximately an equal rate, an unequal strain will be produced and the glass will break. It was found that the metal which had a rate of expansion known more commonly as the coefficient of expansion, which was closest to that of glass, was platinum, and this metal was used in making the short connection between the outside wires and the filament within the bulb through the glass part.

Compensation for Expansion by Heat

A way of using to good advantage the fact that substances possess different coefficients of expansion is exemplified in the compensated pendulum or balance wheels of watches and chronometers. The structure of the gridiron, compensated pendulum, is shown in the figure. It is known that the constancy of the clock that is governed by a pendulum depends on the invariableness of the length of the pendulum. The longer the pendulum, the slower the clock will be, and inasmuch as the temperature of the air varies sufficiently to affect clocks, if not during the day, at least from season to season, some means must be provided for compensating the length of the pendulum so that the clock keeps accurate time at all times.

The Gridiron Pendulum

The gridiron pendulum is made of lengths of two different metals, iron and zinc. In the illustration the iron rods are shown in dark lines and the zinc rods in light lines. Zinc has a coefficient of expansion which is just about two and one-half times as great as that of iron. Hence the length of the iron part of the gridiron pendulum is made about that many times the length of the zinc part. It is clear that the expansion of the iron tends to make the pendulum longer, while the expansion of the zinc part tends to make it shorter. The two work against each other in such a manner that the net result is that the effective length of the pendulum is maintained constant.

Thus for the same reason the balance wheels of accurate watches are made in two parts. The outside rim is made of metal having the larger coefficient of expansion and the inside rim of the metal having the smaller coefficient of expansion. The equal expansion of the two metals bends the wheel into a smaller circle, with the result that, in spite of a change in temperature, the watch continues to keep accurate time.

In making standards of length, steel tapes, etc., it is also necessary to maintain the length of the measuring device as constant as possible. The only way to do this is to make it of such metal that possesses an extremely low rate or coefficient of expansion. Such a substance is the alloy known as invar steel, a combination of nickel and steel, which has a very low coefficient of expansion.

EVERY GAS EMPLOYEE A SALES AID

(Continued from page 658)

Items	Commission	Points
Boilers	$15.00	25
Hot air furnaces	15.00	25
Garage heaters	2.00	15
Fireplace heaters	1.00	10
Radiators (each)	.75	10
Automatic water heaters	2.00	15
Hump. tank water heaters	.50	5
Old Faithful	.50	5
Ironing machine	2.00	10
Clothes dryer	2.00	10
Washing machine	1.00	10
Cabinet range	.75	5
Semi-ind. fixture	.50	2
Fixtures over $10	.50	2
Hot plate	.25	2
Dish washers	.50	2
Laundry stoves	.25	2
Cookers	.25	1
Single and double oven ranges	.25	2
Table lamps	.25	1
Domes	.25	1
Gas irons	.25	1
Top lighters	.25	1
Mantle lights (Gasco or Reflex)	.10	1
Kitchen cabinets	.75	5
Refrigerators	.50	5
Marvel vacuum cleaners	.50	5
$220 light	.10	1

The $1,000 worth of prizes listed on large posters placed in all departments will be awarded to winners according to number of points obtained by them during the campaign. The cash prizes as well as the valuable and attractive merchandise which will be given away for prospects that result in sales should make this activity interesting to all.

HOLDERS WITHOUT TANKS

In gas holders without tanks there is a rising and falling disc within the shell of the holder, and the seal between this disc and the shell is made by liquid. The sealing liquid must be continuously supplied to the gap existing between the disc and the walls of the shell in order to keep the seal gas-tight. It has been found in practice that it is very difficult to distribute the liquid evenly over the whole circumference of the disc, and the hitherto usually practised method of employing a number of pumps to raise the liquid to the top of the shell has not always proved sufficient.

The main object of this invention is to provide improved means to effect an even and efficient distribution of the liquid and thereby enable a good gas-tight seal to be maintained, the arrangement being such that the quantity of the liquid that is caused to run down the inner surface of the walls of the shell into the gap to be sealed is neither too large nor too small.

As The Journal Views It

THE CENTENARY OF GAS IN FRANCE

This year the French gas industry celebrates the one hundredth anniversary of the use of gas in France. This is certainly an important milestone in the history of the French gas industry, also in the history of the gas industry of the world. France is to be congratulated in having reached this point in the development of its gas business. French gas engineers have done much for the progress of the gas business in France. French researches on gas subjects have also had marked effect on progress in gas technology in other countries.

Just as England has its Murdock, so has France its Lebon. Lebon was an engineer of the French government doing experimental work with gas in 1791, completing his investigations in 1799. The idea of the use of gas for lighting purposes came to him one day, when he placed a handful of sawdust in a glass bottle and heated it over a fire, which produced a black smoke that burned with a brilliant flame.

In September, 1791, he obtained a patent upon what was called the "Thermo Lampe." He was, however, not fortunate enough to live to see the results of his invention applied in a practical manner. The first gas works in Paris, based on the work of Lebon, were started in 1818. It is one hundred years since Paris was first lighted with gas, and the fact that gas did signal service in lighting the "Metropolis of the World" is proven by the fact that even before the time of the incandescent mantle, Paris was known as the city of light.

The best wishes of the American gas industry are most sincerely extended to the French industry, and we may say in the words of one of our highly respected English contemporaries, "Vive L'Industrie du Gaz en France."

WATER GAS FROM SOFT COAL

A recent important development, to which the Bureau of Mines has been giving particular attention, is the use of bituminous coal, particularly of the high volatile kind, for the manufacture of water gas. The purpose of substituting these coals for the more expensive coke or anthracite is one of economy.

That this is an important development in gas technology need scarcely be said. The Bureau of Mines' experiments have indicated that it is feasible for gas plants to use these coals in the generation of blue gas, and those plants that are located at some distance from areas supplying anthracite coal, but which are close to bituminous coal mines, will naturally be particularly benefited by the substitution of soft coal for hard coal or coke.

The plants in question are particularly those located in the Central States. It is, of course, to be expected that substitution of the soft coal for the hard coal or coke in the water gas generator will introduce certain disturbing factors which have to be gotten around in some way or another. For example, if the soft coal which is used for this purpose contains a considerable amount of sulphur, some trouble may be expected to result in the purification plant. It is altogether likely that under these conditions there will be a greater load on the oxide purifiers, and in cases where purification capacity is limited, certain changes will have to be made in order that the gas may be sent into the holder in as good a condition as when other fuels were used in the water gas producer.

On the whole, however, the new development may be said to be very satisfactory as far as it has gone. If there are any increased costs in the production of the gas, these are more than counterbalanced by the economy that is effected in the use of oil for carburation, and because of the fact that in many localities throughout the country soft coal is a cheaper fuel than coke or anthracite for water gas production.

It is interesting to note in this connection that the British gas industry, that does not have the same problems to contend with as the American gas works, has been much interested in this development, and is of the opinion that great benefits would be derived from a process that would enable the use of

soft coal for the manufacture of water gas. The field is therefore pregnant with great possibilities and it will be interesting to note just what progress is made along these lines by the American industry.

It is understood that the British gas industry is interesting itself in the matter and may announce important developments therein within a short time. In certain localities in this country coke and anthracite coal have already been substituted by high volatile bituminous coal as a fuel for generation of water gas.

DRIP OIL ACTION ON DIAPHRAGM LEATHERS

(Continued from page 655)

Tests on the Behavior of Leathers Saturated With Each Oil to the Action of Gas and Vapor of Drip Oil

All tests were made with two leathers, one treated with one kind of oil and the other treated with the other kind of oil. The following tests were made.

1. Exposure to gas taken from the city supply. This gas was not entirely free from drip oil vapor but it was not saturated. It represented ordinary gas.
2. Exposure to the same gas with the leathers dipping in the same kind of oil with which they were saturated.
3. Exposure to gas saturated with vapors of drip oil.
4. Exposure in still gas over drip oil.
5. Exposure in flowing gas over drip oil.

The following points were noticed:

In all cases drip oil was absorbed by the leathers. In some cases the leather was bleached in a short time. An extraction of the oil from the leather was established. The loss of oil is due to the presence of vapors of drip oil in the gas.

On the Action of Drip Oil Vapor on Oiled Leather

A matter of considerable interest was brought out by the work, viz., the way in which the vapor acted in removing the oil from the leather.

It was noticed during the tests that leathers exposed grew wetter as the test proceeded. This could only be due to an absorption of liquid, presumably drip oil, from the gas. After a while the leather could no longer hold the augmented liquid and some dropped off. In four tests this dropped liquid was wiped off from the bottom of the chamber and weighed. When the weights were embodied in the calculation of the loss it was found that no oil was lost. This was on account of a compensation with the oil lost, figured from the loss of weight of the leather, and the oil recovered from the bottom of the chamber.

Consideration of the matter led to the proposition that such recovered oil was really lost oil as far as the leather was concerned. In figuring the results such dropped oil was not considered.

Treatment of Leather with Warm or Cold Oil

It was thought well to see if there was any marked difference between the two methods of treatment. As the unblotted tests are open to the difficulty of wiping off the excess oil twice alike, the leathers were blotted in these tests.

The treatment was to work the oil into the leather in warm or cold oil and then let stand twenty-four hours in cool oil.

Results—	Gs oil per g leather	
	Mineral oil	Organic oil
Warm oil mean of 3 tests	.884 gs	.765 gs
Cold oil mean of 3 tests..	.875 gs	.780 gs

No marked difference is to be noticed.

Summary of the Tests

In comparing the two oils there was no marked difference in behavior shown. Both have about the same specific gravity (.9047 for the mineral oil, .9090 for the organic oil at 60 deg. F.) which probably has no bearing on the matter. The leather absorbs slightly more mineral than organic oil. This is not as important as the ability to retain the oil under exposure to gas and vapor of drip oil.

While the tests showed more cases in which the organic oil was better retained there were enough exceptions to prevent a generalization.

In order of loss of oil we have the following from least to greatest:

1. Exposure to gas.
2. Exposure to gas saturated with vapor of drip oil.
3. Exposure to gas with dipping.
4. Exposure in still or moving gas with drip oil in the chamber.

The loss of oil takes place in the manner of a laboratory extraction. The oil in the leather absorbs drip oil from the gas. As the volume of the mixed oils in the leather increases there comes a time when the leather can no longer retain it and some drops off. What falls off is lost to the leather, as by no process of convection can it be returned to the leather on account of its lack of volatility.

There was an intensity imparted to these tests which would not be present in meters in use and the action would be very slow on this account. However, it is reasonable to believe that losses of oil would take place in the same manner, differing in degree and not in kind.

(The original paper contains numerous tabulations of reuslts obtained in the reasearch and detailed explanation of the same. The complete paper is published in the Proceedings of the New England Association of Gas Engineers.—Editor.)

Catechism of Central Station Gas Engineering in the United States

Installment No. 29

(Continued from last week)

Amount of Gas Purified by Given Amount of Iron Sponge

157. What is the maximum amount of gas containing 0.85 pr cent by volume of H_2S that can be theoretically purified at one exposure by a bushel of iron sponge, or mass, which contains an amount of $Fe_2O_3.H_2O$, equivalent to a weight of 25 lbs. of iron? It is assumed that no oxygen is present in the gas. (Give the reaction, or reactions, upon which you base your figures, and also give your calculations.)

Ans. The atomic weights of the various elements which enter into combination to form ferric hydrate, $Fe_2O_3.H_2O$, being iron, Fe, 56, oxygen, O, 16 and hydrogen, H, 1, a molecule of $Fe_2O_3.H_2O$ will contain $56 \times 2 + 16 \times 3 + 1 \times 2 + 16 = 178$ parts by weight, of which 112 parts are iron, and therefore 25 lbs. of iron will form $25 \times \frac{178}{112} = 39.7$ lbs. of ferric hydrate.

According to W. J. Atkinson Butterfield, the reactions on which the removal of sulphuretted hydrogen, H_2S, from gas by $F_2O_3H_2O$ chiefly depend are as follows:

$$Fe_2O_3.H_2O + 3\,H_2S = Fe_2S_3 + 4\,H_2O$$
$$Fe_2O_3.H_2O + 3\,H_2S = 2\,FeS + S + 4\,H_2O$$

The proportion between $Fe_2O_3.H_2O$ and H_2S being the same in both these equations, the amount of H_2S absorbed by a given quantity of $F_2O_3.H_2O$ will be the same no matter what combination of the two reactions actually occurs.

Calculations Continued

The atomic weight of sulphur, S, is 32; so the weight of sulphuretted hydrogen, H_2S, entering into the reaction is $3\ (2\times1+32)=3\times34=102$. Therefore 178 parts by weight of $Fe_2O_3.H_2O$ will combine with 102 parts of H_2S, or 1 pound will combine with $\frac{102}{178} = 0.573$ lbs., and 39.7 lbs. of $Fe_2O_3.H_2O$ will combine with $39.7 \times 0.573 = 22.748$ lbs. of H_2S. But one pound of dry H_2S at 60 deg. F. and 30 in. barometer occupies a volume of 11.1229 cubic feet, so 22.748 lbs. will correspond to $22.748 \times 11.1229 = 253.02$ cubic feet of H_2S.

As the gas is assumed to contain 0.85 per cent by volume of H_2S, it will contain 8.5 cubic feet of H_2S per 1,000 cubic feet. $\frac{253.02}{8.5} = 29.767$, and therefore 29,767 cubic feet is the maximum amount of gas is the maximum amount of gas containing 0.85 per cent of H_2S that can theoretically be purified during one exposure by a bushel of purifying material which contains an amount of $Fe_2O_3.H_2O$, equivalent to a weight of 25 lbs. of iron. Obviously the amount will vary according to the quantity of H_2S in the gas, and also according to the weight of $Fe_2O_3.H_2O$ contained in a bushel of material.

It is also possible by admitting oxygen with the gas, and thus securing a continuous partial revivification, to purify more gas to an exposure than is indicated by the method of calculation given above. Unless oxygen is supplied, however, the duty actually obtained in practice from any material will always be less than the theoretical amount obtained by calculation, as it is impossible, under working conditions, to thoroughly saturate with H_2S all the $Fe_2O_3.H_2O$ in the material.

Maximum Amount of Gas Purified by Given Amount of Lime

158. What is the maximum amount of gas containing 2.25 per cent of carbon dioxide, CO_2, that can theoretically be purified by a bushel of unslaked lime containing 86 per cent calcic oxide, CaO, assuming that the weight of a bushel is 80 lbs. and that carbon dioxide only is to be removed from the gas by the lime? Give all your calculations.

Ans. As the bushel of lime weighs 80 lbs. and contains 86 per cent of CaO it will contain 68.8 lbs. of CaO. When the lime is slaked, hydrate is formed according to the reaction.

Lime		Water		Calcic hydrate
CaO	+	H_2O	=	$Ca(HO)_2$

Since the atomic weight of calcium, Ca, is 40, that of oxygen, O, 16 and that of hydrogen, H, 1, the respective weights are $(40 + 16) + (2 + 16) = [40 + (17 \times 2)]$, or $56 + 18 = 74$. That is, 56 lbs. of CaO will make 74 lbs. of $Ca(HO)_2$ and 68.8 lbs. of CaO will make $68.8 \times \frac{74}{56} = 68.8 \times 1.321 = 90.88$ lbs. of $Ca(HO)_2$.

The equation of the reaction between $Ca(HO)_2$ and CO_2 is: $Ca(HO)_2 + CO_2 = CaCO_3 + H_2O$, the weights being $[40 + (17 \times 2)] + [12 + (16 \times 2)] = [40 + 12 + (16 \times 3)] + [(1 \times 2) + 16]$ or $74 + 44 = 100 + 18$.

We are only concerned with the first half of the quation, from which we see that 74 lbs. of $Ca(HO)_2$ will combine with 44 lbs. of CO_2. Therefore 90.88 lbs. of $Ca(HO)_2$ will combine with $90.88 \times \frac{44}{74} = 54.04$ lbs. of CO_2. CO_2 dry at 60 deg. Fahrenheit and 30 in. barometer weighs 1 lb. for each 8.595 cubic feet, so 54.04 lbs. will be $54.04 \times 8.595 = 464.47$

cubic feet. The gas in question contains 2.25 per cent of CO_2, or 22.5 cubic feet per 1,000 cubic feet. $\frac{464.47}{22.5} = 20{,}643$ and 20,643 cubic feet is the maximum amount of gas containing 2.25 per cent of CO_2 that can be purified by a bushel of unslaked lime weighing 80 lbs. and containing 86 per cent of CaO. Of course, this result could not be reached in practice, as it is never possible to entirely saturate all the calcic hydrate with carbon dioxide under working conditions, even assuming that all the other impurities that would combine with $Ca(Ho)_2$ are removed by other means.

Maximum Amount of Gas Containing Both H_2S and CO_2 Purified by Given Amount of Lime

159. What is the maximum amount of gas containing 1.6 per cent by volume of carbon dioxide, CO_2, and 0.90 per cent by volume of sulphuretted hydrogen, H_2S, that can theoretically be purified by a bushel of unslaked lime, containing 87 per cent of calcic oxide, CaO, assuming that the weight of a bushel is 80 lbs. and that both the carbon dioxide and the sulphuretted hydrogen are to be removed by the lime? Give all your calculations.

Ans. As the bushel of lime weighs 80 lbs. and contains 87 per cent of calcic oxide, CaO, it will contain 69.6 lbs. of calcic oxide. When the lime is slaked 69.6 lbs. of calcic oxide will produce (see answer to question No. 158) $69.6 \times 1.321 = 91.94$ lbs. of calcic hydrate.

When lime is used to remove both carbon dioxide, CO_2, and sulphuretted hydrogen, H_2S, from gas, it will, until nearly saturated, combine with each of these impurities just as if the other were not present, and it does not introduce any great error into the calculation to assume that this continues to be the case until the lime is entirely saturated.

Calculations Continued

Since the gas contains 1.6 per cent of carbon dioxide and 0.9 per cent of sulphuretted hydrogen, there are in every 1,000 cubic feet of the gas 16 cubic feet of carbon dioxide and 9 cubic feet of sulphuretted hydrogen. A cubic foot of carbon dioxide weighs 0.11634 lb. and 16 cubic feet weigh $0.11634 \times 16 = 1.86$ lbs. A cubic foot of sulphuretted hydrogen weighs 0.0899 lb., so 9 cubic feet weigh $0.0899 \times 9 = 0.81$ lb. The reactions by which the lime removes the carbon dioxide and sulphuretted hydrogen are, as given in the answer to question No. 149:

(1) $Ca(HO)_2 + CO_2 = CaCO_3 + H_2O$, and
(2) $Ca(HO)_2 + H_2S = CaS + 2H_2O$.

The atomic weights of calcium, oxygen and hydrogen being as given in the answer to question No. 158, and those of carbon and sulphur being 12 and 32, respectively, the proportionate weights are:

(1) $74 + 44 = 100 + 18$, and
(2) $74 + 34 = 72 + 36$,

showing that 74 pounds of calcic hydrate will combine with 44 pounds of carbon dioxide, or 34 pounds of sulphuretted hydrogen. Therefore, one pound of carbon dioxide will neutralize $\frac{74}{44} = 1.681$ lbs. of calcic hydrate, and one pound of sulphuretted hydrogen will neutralize $\frac{74}{34} = 2.176$ lbs. of calcic hydrate. The amount of carbon dioxide and sulphuretted hydrogen present in 1,000 cubic feet of the gas in question will therefore neutralize $1.86 \times 1.681 + 0.81 \times 2.176 = 3.13 + 1.76 = 4.89$ lbs. of calcic hydrate, and the 91.94 lbs. produced as above from the bushel of unslaked lime of the given composition will be theoretically capable of purifying $\frac{91.94}{4.89} = 18{,}800$ cubic feet of gas containing 1.6 per cent by volume of carbon dioxide, CO_2, and 0.90 per cent by volume of sulphuretted hydrogen, H_2S.

Of course this result cannot be obtained in practice, as it is impossible to thoroughly saturate the calcic hydrate with the impurities under working conditions, and therefore the actual manufacturing results will always be less than the results that are theoretically possible.

Treatment of Iron Oxide in Revivification Process

160. Describe the proper treatment of iron oxide from the time it is taken out of the box for revivification until it is again returned to the box.

Ans. As probably no two samples of iron oxide (the words being used to denote a purifying material in which the active agent is hydrated ferric oxide) are exactly alike, it is impossible to lay down hard and fast rules that will apply in all cases. But there is one truth that must always be borne in mind and acted upon to secure the best results. This is, that revivification will be the more rapid and complete, the higher (within reasonable limits) the temperature of the oxide. Therefore, the treatment should be such as to retain, as far as possible, in the material, all the heat generated by the chemical action that occurs, provided, of course, that this heat is not excessive.

A Treatment Which Gave Best Results

At a works using oxide purchased from three different firms, the following method of handling during revivification was found to give the best results:

As the oxide was removed from the box it was thrown on to the revivifying floor, beneath the box, in two heaps, each about 8 feet high, and allowed to remain in these heaps until it was thoroughly heated, the length of time required for the attainment of this result varying from one or two hours for fresh, active oxide, to 48 hours or more for that nearly spent, or sluggish from any other causes. When hot it was taken from the heaps and placed on the floor, in long ridges, whose cross section was approximately an equilateral triangle with 24 inch sides. Spaces were left between the ridegs, and as

the oxide on the two exposed faces revivified, as shown by its change of color, it was scraped down into these spaces until the whole batch was spread out in a layer, with a uniform depth of about 9 to 10 inches. It was then turned over with shovels, care being taken to have it really turned, and the material that had been on the bottom placed on top, instead of the whole mass being merely shoveled to one side, which is very often all that th so-called turning over amounts to. By this time it was usually thoroughly revivified. If not, it was again turned over as often as necessary. When revivified the batch was piled in a heap about 6 feet high and 4 to 6 feet wide, to remain until it was put back into the box in due course. Sufficient time was allowed to elapse between each handling for complete revivification of the top layer of oxide. During the operation the oxide was never wet unless it became excessively heated, or so dry that there was a loss and a nuisance in handling, owing to the dust arising from it. By thus keeping the oxide as dry as possible, all the heat produced by chemical action was made available for maintaining the temperature of the material and thus promoting complete revivification, instead of being used up in vaporizing the added water.

Care in Handling Batches of Fresh Oxide

In handling batches of fresh oxide care must be taken to prevent their becoming so highly heated as to ignite the sulphur and shavings contained in them. Even in such cases, however, it is better to allow the oxide to stay in heaps, as since less surface is exposed to the air in this way the liability of ignition is less, and if it does occur the fire can be more readily extinguished by the use of water. Such heaps should be examined at frequent intervals and any tendency to fire promptly corrected. Ignition cannot occur with wet oxide until the water has been practically all evaporated, so wetting the oxide will always prevent it. But as wetting also retards revivification it should only be resorted to in cases of necessity. Spreading the oxide out in thin layers and turning it constantly will also cool it.

If the batch of oxide does not heat and revivify properly when handled as above, and its record shows that it is not yet saturated with sulphur, it can sometimes be brought into good condition again by being exposed out-of-doors in the sun during the warm weather, the sun imparting the heat necessary to start and maintain the revivification. Or the batch can be heated artificially.

Another Method of Revivification

Another method of revivification consists in placing the oxide, when taken from the heaps, on a platform of purifier trays supported about a foot above the floor of the revivifying room in such a way as to permit a free circulation of air underneath the whole bed, the oxide being spread in a layer 24 in. to 30 in. deep. When using such a platform, revivification takes place on the bottom as well as at the top of the layer, proceeding faster on the bottom. When the batch is turned the oxide still foul should be put on the trays, and the oxide that has revivified either piled to one side or placed on top of the foul oxide. If this method is used with active oxide great care will be necessary to prevent firing, as revivification proceeds very rapidly owing to the fact that air passes up through the oxide instead of merely being in contact with it.

Regulating Air Admission to Purifying Boxes

161. Describe an arrangement by which the percentage of air admitted for continuous revivification of the oxide in the purifying boxes can be kept under control.

Ans. An arrangement for delivering a regulated amount of air for the continuous revivification of the oxide of iron in the purifying boxes that is simple and is coming largely into use consists of a small positive blower driven by a belt from a shaft of the exhauster used in pumping the gas from the retorts in the case of a coal gas works and from the relief holder in a carburetted water gas works. The respective capacities per revolution of the exhauster and the blower being known, the relation between the speed of the blower and that of the exhauster for any given percentage of air desired can be readily calculated, and the pulleys required to produce this relation placed upon the two shafts. When it is desired to make a change in the percentage of air being used it can be done by making the proper change in the size of the pulley on the blower shaft. When such an arrangement is first installed the accuracy obtained in the desired relation between the amount of gas passed by the exhauster and that of air furnished by the blower should be checked by passing the air through a meter and comparing the readings of this meter with those of the station meter, and this check by measurement of the air should be repeated at regular intervals so as to be certain that the desired percentage of air is being furnished. It will not be necessary, however, to take continuous measurements of the amount, since the arrangement is sufficiently positive to be relied upon for the interval between checks. The air pipe should be provided either with a water seal or a check valve, which will prevent any gas from escaping when the exhauster is stopped for any reason, as when this occurs the blower will stop also, and if neither a seal nor check valve is provided gas will blow back out of the air pipe.

Use of Vacuum

In a coal gas plant where there is a sufficiently high vacuum at the inlet of the exhauster the air required can be drawn by means of this vacuum into the exhauster inlet through a safety seal and a dry meter. When this arrangement is adopted the quantity of air that is being drawn in should be checked at frequent intervals by reading the station meter and the air meter and comparing these readings to see if the amount of air is the proper percentage of that of gas. If the percentage is not correct the necessary

adjustment should be made on the stopcock with which the air pipe is provided. This method requires less apparatus than the one first described, but on the other hand it calls for a greater amount of supervision.

Revivification of Oxide Without Renewal From Purifiers

162. Give a description of some method of revivifying iron oxide without removing it from the purifying boxes, and state the precautions that should be observed to prevent the oxide from firing during the operation.

Ans. The simplest way of revivifying iron oxide without removing it from the purifying box is to have a pipe connection that can be temporarily attached to the cleaning hole in the bottom of the box. This pipe connection should be long enough to reach outside the building and should be equipped with a steam jet by means of which air can be drawn down through the oxide and discharged outdoors.

If cleaning holes are not provided in the bottom of the purifiers a permanent wrought iron connection can be made either to the inlet pipe or to the bottom of each purifier, these connections being run together into one pipe arranged with a steam jet and outside discharge as above. Either a valve or a water seal must be provided on each connection, the closing or sealing of which will prevent any gas from leaking from the boxes in use and being blown out into the air. The use of water seals instead of valves on these connections is advised by several engineers who have employed this method of revivification, because they found that the valves became clogged, making it difficult to shut them tightly.

How the Operation Is Carried Out

When revivifying oxide in this way the cover should be taken off the box before beginning operations, and the temperature of the oxide should be carefully watched to see that it does not rise too high. If it does get dangerously high it can be reduced by wetting the oxide by means of a hose. The temperatures should be taken at different places in the box by thermometers inserted in pipes driven into the oxide.

Care must be taken to make sure that the lid of the cleaning opening, or the valve on a permanent connection, is tightly closed before gas is turned on to a box again after the oxide in it has been revivified. In case a water seal is used instead of a valve, the seal must be filled with water after the operation is finished.

Calculation of Required Amount of Oxide

163. If you had a set of purifiers consisting of four 10 ft. × 10 ft. × 4 ft. boxes in which you wished to use oxide of iron in one layer 3 ft. 0 in. deep in each box, how many bushels of oxide would you buy or make up? The amount given should include not only the oxide actually in the boxes at any one time, but also that which it would be necessary to have on the floor at the same time, to make it certain that each lot of oxide would be afforded the opportunity for complete revivification. Give the reasons for your answer.

Ans. The volume of oxide of iron required to fill a purifying box 10 ft. square to a depth of 3 ft. 0 in. will be $10 \times 10 \times 3 = 300$ cu. ft. Purifying material being measured by the struck bushel, which contains 2,150 cu. in. or 1.24 cu. ft., 300 cu. ft. will be $\frac{300}{1.24}$ = 242 bushels, so that each batch of oxide will have to contain 242 bushels.

Factors Involved in the Calculation

The number of batches that should be kept in use for a set of four boxes will depend somewhat upon the area of the space available for revivifying purposes. It is very important that the oxide should be fully revivified before it is put back into the purifying box, since if not so revivified it cannot do good work, and any attempt to get along with an insufficient number of batches leads to continuously deteriorating results. Therefore, when it is possible to secure the necessary area, it is best to keep in use eight batches, each box having its own two batches, which are used only in it. This allows each batch to remain on the revivifying floor at least four days, even when the conditions are so bad that it is necessary to change a box every day. If working under better conditions there is still more time for revivification and the oxide is in just that much better shape, since the longer it remains exposed to the air under favorable conditions the more certain it is to be thoroughly revivified.

If it is impossible to secure sufficient area to permit of handling the eight batches, seven or even six can be made to do, although the working will not be as satisfactory as with the larger number. But even under this condition a volume of oxide equivalent to either one or two batches should be kept on hand, in addition to that in actual use, so as to be able to allow a batch that does not revivify in time to be used in its turn, to be set aside and replaced from the stock. It is therefore necessary in the case given to buy, or make up, $8 \times 242 = 1{,}936$, or say 1,950 bushels of oxide.

Value of Spent Oxide

164. What makes spent oxide valuable?

Ans. The two substances whose presence in spent oxide contribute most to its commercial value are Prussian blue and free sulphur, the former being found in oxide which has been used for the purification of coal gas.

(Thirtieth Installment Next Week)

The Industrial Gas Business

Description of some interesting industrial uses of gas

W. D. Thompson

Manager Industrial Gas Department of Northern Indiana Gas & Electric Company

THE industrial business is very desirable to any gas company because it is the most profitable end of our business. It gives the greatest income per dollar invested and the greatest income per dollar of sales and service expense. It is the potential future of the gas industry. Today we are selling 75 per cent of our production to domestic and commercial customers and only 25 per cent to industry. I make the prediction that within five years this division will be on a 50-50 basis. Also the time is coming when 75 per cent of the gas sold in this country will be for industrial purposes.

It is only through this expansion that the gas industry will be able to take on the large house heating load. Everything is great or small by comparison. The possibilities of the house heating load compared with our present send-out would, as one man put it, wreck the gas company. But if we compare these possibilities with what the future load will be, the problem vanishes.

Relation Between Industrial and House Heating Business

So you see it is of vital importance that we go after the industrial business now. The sooner we get this business the sooner we will get the house heating business. We must still keep our retail trade, but let us expand into the wholesale trade.

But before you go after it, sell yourself on the idea of gas fuel. Selling, like charity, begins at home. What do you use in the tool forge in your shop? In the blacksmith's forge? Wherever you use heat in your work? Go back and try gas. Find out what an ideal fuel gas really is. Then you will appreciate the slogan, "If it's done with heat you can do it better with gas."

This business is highly competitive; something new for a public utility. The industrial customer does not look on gas as a necessity. Do not expect him to come to you. You will have to solicit his business with the best ability obtainable.

The Engineer Must Be Sold on Gas

The industrial gas engineer must be thoroughly sold on industrial gas and its possibilities. He should have engineering training in order to make an analysis of plant conditions and problems. He should be able to talk intelligently and convincingly, not only to men in the office, but also in the work shop. For it is a fact our product is sold by convincing the man on the furnace, and he in turn convinces his management by production records, etc.

The Survey

You should make a local survey of all plants to determine the potential industrial business to be obtained. The following sheet will give you an idea of the scope of this survey and its value to the gas company:

INDUSTRIAL GAS REPORT

Town..... Date.....
Name of Company.....
Address .....
Manufacturers of .....
Name and Title of Persons Talked to.....
Present Gas Consumption per Month....Cubic Feet
Present Maximum Hourly Demand.....Cubic Feet
Gas Used for:.....
.....
.....
Other Fuels Used per Month: (a) Kind of fuel (b) Amount. Used for—
.....
.....
Cost of Other Fuels.
(a) F. O. B. Plant (b) Burned in Furnace
.....
(b) Includes freight, switching, demurrage, leakage, shortage, unaccounted for, unloading, storage, pumping, heating, burner expense, air or steam for combustion, furnace maintenance, loss of production, taxes, insurance, land value, investment, power, and labor.
Gas Consumption to be Gained per Month....Cu. Ft.
Estimated Increase in Maximum Hourly Demand "
Remarks: .....
.....
.....
.....
.....
.....
.....
.....
.....
.....
Signed.....
Industrial Gas Engineer.

The Cost Figures

From a sales point of view, the most important item on this sheet is the cost of other fuels burned in the furnace. When the manufacturer realizes his total cost on other fuels, he is more than convinced

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*Delivered at the 16th annual meeting of the Indiana Gas Association.

of the economy of using gas. In nearly every case we have analyzed this item is between two and three times the invoice price of the fuel. It is not what it costs to buy it, but what it costs to use it.

The gas engineer does not have to be experienced in furnace design. He can receive very valuable help from the industrial furnace manufacturers. Let them quote you on their best furnaces. Price should be considered secondary. They will be paying you gas bills long after they have forgotten the price of the furnace. One of the things that has hurt the sale of industrial gas more than anything else is the inefficient and make-shift furnaces that have been installed because they were cheap.

We must spend money in order to get this business. It is NEW business. There is pioneering work still to be done. Money spent for trial installation and experiments is well invested and I am sure you will be well repaid.

Some Industrial Gas Applications

1. Heating "I" beams to be expanded into forming the Bates Expanded Steel Poles used on electric transmission work. This furnace has a capacity of ten tons of poles per hour, and when running normally averages 10,000 cubic feet of gas per hour, or 1,000 cubic feet of gas per ton of poles.

2. Continuous forge furnace feeding two hammers. This furnace has a capacity of approximately 3,500 feet of gas per hour and turns out approximately one ton of steel per hour.

3. In a twin heat treating furnace for heat quenching steel at 1550 deg. F. Gas consumption on the twin is about 1,500 cubic feet per hour, and turns

4. Continuous heat treating furnace for drawing the temper on steel at 900 deg. F. This furnace uses approximately 2,000 feet of gas an hour, and turns out approximately two tons of steel per hour.

5. Rivet heater, showing the adaptability of gas in so far that these heaters are mounted on platforms and the hot rivets are used in riveting roof members on steel framed box cars. These are double opening rivet heaters, delivering two, three or four sizes of rivets from the same furnace. On hand gun work, the gas consumption averages about three to four cubic feet per pound of rivets.

6. Rivet making furnace. This furnace heats the round stock in the shape of rods, averaging 20 feet in length, which are fed into the rivet making machine. This furnace has a maximum capacity of 18,000 cubic feet of gas per hour and when heating 1¼ in. round stock, the average gas consumption is 4,000 cubic feet to the ton; on ½ in. it is about 2,000 feet to the ton; the difference being that the smaller sizes are run at lower temperatures, 2100 deg F., and 1800 deg. F., respectively.

7. High pressure gas cutting torch, using city gas and oxygen for metal cutting. The over-all cost is only slightly in favor of city gas, but the saving of large investment and labor cost for handling acetylene tanks, and numerous other advantages, makes it an attractive proposition where high pressure gas is available. The city gas consumption on this torch is from 40 to 80 cubic feet per hour, depending on the kind of metal being cut.

Gas in Welding

8. In welding furnace. This furnace is used for welding tubes of boiler iron and operates without any flux on the metal and produces a perfect weld. Gas consumption is about 400 cubic feet per hour, producing two welds per minute on ¾ in. pipe.

9. In core ovens. The cost of gas per hundred pounds of cores is less than either coke or oil, and the quality and quantity of cores is considerably improved, due to the method of operating the gas oven. Complete burner equipment for these ovens costs less than $200, and as this was the price of a steel stack and foundation work alone, formerly used on each of these ovens when fired with coke, you can see there is a considerable saving in first cost. Size of each oven is 6 ft. w. by 1 ft. h. x 12 ft. d., using 700 feet of gas per hour; average of 2,000 feet gas per hour; average of 2,000 feet of gas per ton of dry cores, a load every two or three hours.

10. In plate heating furnace. The furnace will turn out 100 plates an hour, weighing 250 pounds each, on a gas consumption of approximately 25,000 cubic feet. The furnace is continuous, in that the material moves forward through the furnace at a pre-determined rate.

11. In an acid retort. The fine control of temperature enabled the company to obtain a greater yield of acid than ever before. This additional acid more than paid for the gas bill.

12. In retorts for evaporating zinc in a silver refinery. These people could not afford to use oil again if it was given to them.

Conclusion

It is unfortunate, but nevertheless true, that the gas industry as a whole is not thoroughly sold on the possibilities of industrial gas, and it is with that idea in view that I have attempted to show in this paper the gas companies' side of the method of getting business.

In closing, I want to make clear one point. Don't let the price of gas stop you from going out after industrial business. You may not get all of the business at your particular rates, but you will get some, and you will also get some valuable experience which can be used later, should the price of gas be reduced or the cost of competitive fuels be increased

MARKET REMAINS UNDECIDED

(Continued from page 656)

level of each and every economic factor until a completely new relationship satisfactory to producer and consumer has been established.

Production Costs Still High

In our own instance a reduction took place in manufacturing profits. This was originally caused by a rapid increase in industrial wages, and was not sufficiently counteracted by a corresponding increase in the price of the manufactured article. In addition, high overhead and distribution expense raised the cost of the industrial product. This resulted in price levels making it unprofitable for the wage earner to buy commodities and more profitable to invest his wages in savings banks, insurance or in permanent additions to his fortune, as the purchase of real estate and homes. Industry has persistently tried to correct this tendency first by cutting profits and later the cost of production itself. The attempt has not been particularly successful, with the result that production costs have remained high during the present year, showing a slight decline only during the last months. This decline, however, has been put to good service and notwithstanding a further slight reduction in the general commodity price situation, there can be seen an improvement in the scale of industrial profits, indicating that the manufacturer is today able to protect his interests better than before.

Not sufficient attention, however, is paid to the employment situation. Industrial employment has been very regular during the whole of the preceding year, showing hardly any seasonal variation. During this year manufacturers have been more careful with their labor policy and fewer men are carried on the wage rolls during the present summer season. While this can not be properly called "unemployment," there is no denying the fact that the existing employment figures in most industries are coming dangerously near the levels of the pre-war period.

No Reason for Alarm

But even when this aspect of the situation is taken into consideration there is no reason for alarm. The present decline follows a period of high economic activity very favorable to the wage earner, as it has enabled him to accumulate credits, now available for his running expenses. There is in consequence no real buying slump. On the contrary, retail business, although retarded, operates at satisfactory levels in all lines making articles required for everyday consumption. There are no bread lines and none are to be expected, unless the unforeseen should happen. The wage earners and salaried men will be able to finance themselves until better times arrive.

In the meantime the caution counselled early this year should not become over-cautiousness. Careful buying and manufacturing, which are commercial virtues when exercised within reason, may easily be vices when overdone. They deprive business of its principal asset, that of having on hand a stock for willing purchasers to select from.

There is evidence that the lowest point in the present depression has been reached or is immediately ahead. Recovery when it comes will be speedy and it is natural that the merchant who has foreseen its coming will best be able to take care of the new opportunities afforded.

TOTAL SULPHUR IN GAS

In an abstract from the "Chemiker Zeitung," "Das Gas und Wasserfach" for March 15 states that, in the usual method of determining the total sulphur in gas by combustion of a measured quantity, and absorption of the products in caustic soda, there is always the risk, if a wet meter is used, of sulphur compounds being either given up to, or taken from, the water by the gas in the passage. This is especially the case with unpurified gas. A. Klemmer recommends passing the gas before combustion through a mixture of high percentage hydrogen peroxide with concentrated caustic soda. This mixture has a strongly oxidizing effect on sulphuretted hydrogen, as well as carbon bisulphide, carbon oxysulphide, and mercaptans. Certainly thiophene is not oxidized; but the quantity in coal gas is so small that any error in this connection is negligible. If 10 c.c. of hydrogen peroxide are mixed with 80 c.c. of concentrated caustic soda, a thick crystalline liquor is formed consisting of $Na_2O_2 + 8H_2O$. This is poured into a Drehschmidt washing flask, and the gas is passed through it. If only one flask is used, the gas should not flow at a greater rate than 100 litres per hour.

After passing the gas, the contents of the flask are rinsed into a 500 c.c. beaker, and acidified with hydrochloric acid to decompose the sodium peroxide. The hydrogen peroxide formed is then driven off by boiling, and finally the sulphuric acid precipitated as barium sulphate by means of a hot solution of barium chloride. It is claimed that this method can be worked much more quickly than the usual process for determining total sulphur. As there is no need for preliminary combustion of the gas, it can be carried out in places where there is danger of fire, which is a great advantage in testing crude gases. Finally, it can be used for ascertaining the sulphur content of non-combustible gases, or, by using a vacuum pump, of gases which are not under pressure.

GAS CHEAPEST FUEL

Except for the heat of the sun, which is gratis, gas is at once the least expensive, most efficient and easiest to use of all forms of heat known to science. For the price of a gallon of gasoline you purchase sufficient gas to cook all the meals of the family for a week.

For every heat unit used to cook a dinner with gas it costs nearly three times as much per heat unit for gasoline to run the automobile. This is owing, for the most part, to the excellence of modern gas-burning appliances. An automobile rarely is able to use more than 15 per cent of the heat units contained in a gallon of gasoline. Gas ranges are made to use an average of 40 per cent of the available heat in a cubic foot of gas.

CUSTOMER OWNERSHIP IN THE U. S.

(Continued from page 654)

from a description of one of them. For instance, in Novtmber, 1923, plans were perfected for an intensive, ten-day campaign in Denver, Colorado, to sell the preferred stock of the Public Service Company of Colorado, an important subsidiary of the Cities Service Company.

During the week preceding the opening of the campaign several meetings of employees, of whom there are 1,500 on the company's payroll, were held, lasting from thirty to forty minutes each, for the purpose of outlining the work to be done and for supplying them with necessary information for properly presenting to the company's customers the advantages of the preferred stock as an investment. The employees were also given copies of advertising booklets and folders for home study and distribution among prospects, and a little book containing sales instructions and answers to questions that might be asked.

Kind of Advertising Used

The advertising used in the campaign was as follows:

1—A one-page explanatory and educational advertisement was run in all the Denver daily newspapers during the first three days of the drive, and a half-page selling advertisement during the next seven days.

2—A folder, describing the security offered, the reasons for the sale, and the advantages of customer ownership, was mailed to every one of the company's 15,000 customers the day before the sale started.

3—Another folder, presenting direct selling arguments, was sent to every customer on the fourth day of the campaign.

4—A miniature daily newspaper giving news concerning the progress of the campaign was published for the benefit of the employees on each day of the campaign.

Employees Assist in Sales

On the opening day the employees were each given a list of ten customers of the company upon whom they were asked to call during the ten days the campaign lasted. Daily reports of progress made were filed at headquarters. In this way the campaign manager kept in constant touch with his field forces, and rendered special assistance to individual workers whenever and wherever it was needed. The result of each day's sales was posted both as an encouragement to greater effort, and also to let the workers know the progress being made. A commission of $2 was paid employees on each share sold.

The result of the campaign was that 16,600 shares of preferred stock, having a par value of $1,660,000, had been sold to 5,545 customers.

Utility Advertising Educates Public

The work that is being done by the public utility companies, through advertising, to promote customer ownership, is of inestimable value in the education of all classes of people upon the subject of investments. The public is being tought to discriminate between the visionary, untried and highly speculative propositions and those that have been established many years and have fairly long records of dividend payments. The advertising, if properly written, plays a most important part in this work.

Helps to Eradicate Socialism

Anyone who has lived in a community in which socialism and some forms of radicalism are prevalent knows that one of the best ways to overcome the hostilities of their advocates is to induce as many of them as possible to become shareholders in the local gas, electric light and street railway companies.

However much opposed they may once have been to a public utility that has been giving the community adequate service at a reasonable cost, when they become financially interested in its affairs, their mental attitude toward what they formerly considered "an oppressive monopoly" changes unconsciously. They realize that the attacks they made upon the company were harmful to its interests and if continued, now that they are shareholders, may, in the end, impair the value of the securities they hold. Their open hostility, therefore, soon ceases.

Advantages of Wide Distribution

How helpful a wide distribution of the securities of a public utility may be is shown by the experience of the railroads of the United States after the Great War ended. For eighteen months the railroads had been operated by the Government in a highly inefficient and extraordinarily expensive manner.

When the several companies finally sought to regain control of their own property, it was evident that pressure would have to be brought to bear upon Congress, preferably by the security holders of the railroads, in order to secure the enactment of proper legislation.

This was done through various agencies and the railroads were returned.

Customers Must Be Kept Satisfied

The interest of the public utility company in the shares it sells to its customers should not cease when the transaction is closed. It should keep customers sold on their purchases. If, after holding them for a short time, the owners throw the shares on the market, other purchasers for them must be found either by the customer or the company. In such instances the company loses the opportunity to sell treasury stock and, to that extent, is hindered in raising fresh capital. People are sometimes forced to part with their shares by circumstances over which they have no control, in which case, they should, if necessary, be assisted in marketing them. But there are others who dispose of their shares who would not do so if they had been properly advised beforehand. Unfounded rumors, lack of con-

fidence in the safety of their investment, and ignorance of important facts regarding the company's affairs are often responsible for their action.

Publicity

How to keep your customers so well satisfied with their investment that they will want to hold on to their shares as long as possible is therefore a problem that deserves serious consideration. One of the most practical methods that has been successfully employed in accomplishing this result is that of publicity. Do not be content with sending your customers copies of annual reports, which, because of their length or the unattractive cut-and-dried form in which they are presented, are often never read. Let some one who knows how to write entertainingly and convincingly take the really vital and interesting facts and embody them in a one or two-page letter signed by the president or chairman of the board, and mail copies to all customer owners. Nearly everyone who receives such a message will read it, if for no other reason than because it is addressed to him personally and bears the signatureture of the company's chief executive.

Monthly Bulletins

These annual reports should be supplemented by monthly bulletins giving live news about the company's affairs. They should tell of improvements being made in the service; of additions to the plant and extensions of lines into nearby districts; of new appliances that are being introduced to reduce household drudgery; of court decisions affecting public utilities; give account of balls, entertainments and picnics of employees; introduce the employees who come in contact with the public and tell what their duties are, etc. These news bulletins to a limited extent may be printed on the back of the monthly or quarterly earnings statements regularly sent to stockholders with dividend checks; or they may be published in the form of a company magazine or newspaper, or a single sheet broadside, copies of which are mailed to both employees and stockholders. You must decide which of these forms of publicity is best adapted to the community in which your company is located.

A Few Suggestions

In concluding, may I offer a few suggestions that may be of assistance to companies undertaking customer ownership campaigns?

If you do not follow the intensive campaign methods I have described, but prefer the more leisurely way in which the effort put forth is constant you will find it expedient to permanently employ regular salesman. Pay them sufficient commissions to keep them interested in their work and ambitious to increase their earnings by larger sales. In America, 2 or 3 per cent is the usual commission allowed. Notify your employees that you will pay a certain amount for each name of possible prospects they may furnish the sales department. Hold meetings of salesmen from time to time at which helpful talks on the plans, policies and achievements of the company are given by the higher executives.

Support of Personnel Necessary

Unless your employees, as well as the president and other executives, are thoroughly convinced of the desirability of inviting customers to become partners in your company through the purchase of shares, your efforts will be far less productive than they otherwise would. Any task undertaken by an organization that has behind it the earnest support of its entire personnel, backed by the conviction that its accomplishment will benefit not only the company itself, but all who participate in it, is bound to be successful. There is an irresistible power in concentrated effort exercised in behalf of a just cause that breaks down all barriers and brings victory to those who seek it.

SAID GORE TO WEBSTER

Gore once advised Webster, "Make yourself useful to your friends and a little formidable to your enemies." Presumably admirable advice to a politician. Why not equally good advice to a business man?

Business is more like politics than business men sometimes admit. By that I mean that many of the qualities essential to success in politics are qualities that will go far toward bringing success in a business career.

It is all very well for a man to take the high stand that he is going to succeed through his own unaided efforts, that he is not going to call upon anyone for help, that he needs no friends. Independence of spirit may be a good thing, but it is not a very practical thing in business.

In the first place, unless you have ample capital of your own at the outset, you cannot go into business without friendly aid. You cannot go into business on borrowed capital without requiring assistance from some source, either in money or in credit. Someone must be friendly to you—and you make friends by being useful to people.

You cannot build a business of large dimensions without developing friendliness among patrons. You want people to patronize you because you give them their money's worth. They can get their money's worth in many places. You need to make them your friends so they will come to you for that reason as well as for other reasons.

Make yourself useful to people. Make yourself their business servant in some degree. Please them by your manner and by your speech. Ingratiate yourself with them politician-wise. And make yourself formidable to your competitors, to all who would take your business away from you.

The successful business man ends by being useful to his friends and formidable to his enemies. Why not start with that attitude?

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	(*)
Kanawha mine run	Columbus	(*)
West Virginia lump	Cincinnati	2.00 to 2.25
W. Virginia gas mine run	Cincinnati	1.25 to 1.50
Midwest		
Indiana 4th vein lump	Chicago	2.75 to 3.00
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.90 to 3.10
Big Seam mine run	Birmingham	1.75 to 2.10
Southeast Kentucky lump	Louisville	2.00 to 2.25
Southeast Kentucky mine run	Louisville	1.25 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

Market	Freight rates	Independent	Company
Egg New York	$2.34	$8.75 to $9.25	$8.45 to $8.85
Egg Philadelphia	2.39	8.80 to 9.60	8.80 to 8.85
Egg Chicago (net tons)	5.06	7.86 to 8.00	7.83 to 7.90

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$2.75 to $3.00
Wise County, furnace	3.75 to 4.50
Alabama, furnace	5.00 to 5.50
Foundry, Newark, N. J., del.	10.41
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.00
Foundry, St. Louis	12.00
Foundry, Granite City, Ill.	9.00 to 9.50
Foundry, Alabama	5.50 to 5.75

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.60
Corning, Ohio	1.90
Lima	2.18
Pennsylvania	3.00 to 3.25
Wooster, Ohio	2.00
Indiana—Illinois.	
Illinois	1.97
Indiana	1.98
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	.90 to 1.05

* No quotation, due to strike.

Gulf Coast.

Gulf Coast, Grade A	$1.75
Gulf Coast, Grade B	1.45

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5¼ to 6c
Gas Oil (32-36) Illinois-Indiana,	4.93 to 5.18
Gas Oil (32-36) Oklahoma, gal.	2⅝ to 2¾c
Gas Oil (32-36) Gulf Coast, gal	5⅛c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$63.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	56.00 to 59.00
Six-inch and over, Birmingham	52.00 to 53.00
Four-inch, New York	69.60 to 71.60
Six-inch and over, New York	64.60 to 65.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs.	$2.45 to $2.50
Potash prussiate, yellow casks, lb.	18 to 18½c
Potash prussiate, red casks, lb	37½ to 40 c
Soda prussiate, yellow casks,	10½c
Soda sulphocyanide, barrels, lb.	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

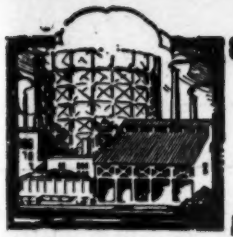
Benzol C. P. tanks, works, gal.	24 to 25c
Benzol, drums, gal.	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal.	28c
Napthalene, flake, barrels, lb.	5 to 5½c
Napthalene, dyestuff bags, lb.	4½ to 5 c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal.	29 to 30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal.	36c

Petroleum

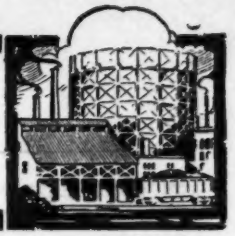
There were several declines in crude oil prices during the past week, starting with a cut in Pennsylvania crude and extending to Ohio, Indiana, Illinois, Louisiana, Gulf Coast, Mexia, Currie and Powell fields. These reductions, in connection with the prorating of crude oil purchases in the Midcontinent, have given the buying companies a better control of the situation. Production for the week ended June 5 showed a drop of 7,300 barrels, this being another development on the constructive side of the market, from the refiners' standpoint.

Gas Oil

Gas oil was meeting with a routine call, and was quoted unchanged at 5¼c to 6c per gallon, f. o. b. Bayonne. The report of the Bureau of Mines of the Department of the Interior for May shows the output of fuel and gas oils for the month was 1,155,935,780 gallons, an increase of 39,172,117 gallons over April. Stocks decreased 25,026,802 gallons, total holdings at refineries June 1 being 1,530,112,132 gallons. Exports and imports both increased during the month, exports by 13,508,496 gallons and imports 20,803,847 gallons.



NEWS OF THE GAS INDUSTRY



Tentative Program of the Annual Meeting of the Canadian Gas Association

The seventeenth annual convention will be held in Toronto, Canada, Thursday and Friday, August 28 and 29, 1924.

Papers and Reports

1—"Our Experiences with Tulley Gas at Belleville," by William Harden, manager gas works department, Belleville, Ont.

2—"The Industrial Fuel Situation," by Frank F. Cauley, manager industrial fuel department, People's Gas Light and Coke Company, Chicago, Ill.

3—"Description of Manufactured Gas Plant for Iroquois Gas Corporation, Buffalo, N. Y.," by J. S. DeHarte, Jr., president Isbell-Porter Company, Newark, N. J.

4—"Machinery in the Distribution Department of a Gas Company," by E. S. Stanton, superintendent distribution department, Montreal Light, Heat and Power Company, Montreal, Que.

5—"Recent Manufacturing Developments at Rochester, N. Y.," by W. H. Earle, superintendent gas manufacturing department, Rochester Gas and Electric Corporation, Rochester, N. Y.

6—"Plotting Relative Costs of Fuels," by R. O. Wynne-Roberts, chemical engineer, Toronto, Ont.

7—"Progress Today on House Heating with Gas Fuel," by H. E. G. Watson, superintendent industrial fuel department, Consumers Gas Company, Toronto, Ont.

8—Reports of representatives, managing committee sections, American Gas Association: (1) Technical Section, J. J. Humphreys, Montreal, Que.; (2) Publicity Section, F. A. Jansen, Ottawa, Ont.; (3) Commercial Section, W. B. Johnson, Toronto, Ont.; (4) Manufacturers Section, G. Hobbs, Toronto, Ont.; (5) Accounting Section, J. J. Armstrong, Toronto, Ont.; (6) Industrial Section, C. D. Slimpin, Montreal, Que.; (7) Gas Standards and Service, Arthur Hewitt, Toronto. The Accounting Section report will likely be presented, with an address on the activities of the section in general, by A. L. Tossell, Chicago, chairman on state representatives and contributions to monthly, American Gas Association.

9—"Report of Meters Committee, Canadian Gas Association," by J. B. McNary, chairman of committee, Hamilton, Ont.

Convention Meetings

The first day session of the convention will be held in the fine new spacious club house of the Royal Canadian Yacht Club, Toronto.

Sessions

The first convention session will be held at 10:15 a. m., in the convention hall of the Royal Canadian Yacht Club. This session will end at 1 p. m., when luncheon will be held, all members being guests of the association.

The afternoon session will begin sharp at 2:30 p. m., August 28, and conclude at 4:45 p. m.

The unfinished business, papers, reports, etc., of the association, will be taken care of in the convention hall of the Consumers Gas Company.

Entertainment

The ladies are invited to take full advantage of the rest afforded on the grounds and spacious balconies of the Royal Canadian Yacht Club, Toronto Island, during the morning of Thursday, August 28, while members are in session.

2:30 p. m., Aug. 28—Ladies will be taken for a two-hour sail around Toronto harbor and Lake Ontario, arriving back at club house at 4::30 p. m.

5 p. m.—Steam yacht will take convention party back to city.

5:30 p. m. to 7 p. m. is left open for delegates to obtain evening luncheon or dinner before proceeding to the grounds of the Canadian National Exhibition.

7:30 p. m.—Members and guests will meet at this time at the Toronto Exhibition and go direct to the Coliseum building, at east end of grounds, where they will be given reserved seats as guests of the association, to hear the wonderful Pageant Chorus of over 2,000 voices.

Western Gas Construction Company Buys Land

Fort Wayne, Ind.—The Western Gas Construction Company has just consummated a transaction whereby the company becomes owner of a 25-acre tract of land in the eastern industrial section of this city. The land has been acquired, local officials of the company say, with a view to ultimate enlargement of the plant.

While no definite plans for extension of the plant have been made, the company considered it advisable to take over the 25-acre tract because of its proximity to the present plant. The tract is located along the Pennsylvania Railroad.

For the present the land will be used for athletic purposes by employees of the Western Gas Company. A baseball diamond has already been laid out.

New House Heating Rates for Concord

Concord, N. H.—The new rates announced by the Concord Gas Company and authorized by the Public Service Commission have gone into effect. For the first 40,000 cubic feet the rates are the same and then they gradually decrease on a sliding scale, with the rates growing lower as the volume of gas used grows larger. The minimum charge remains the same as before, 35 cents. All bills must be paid on or before the 10th of the month in order to secure a discount.

A special house heating rate is included in the new schedule designed to enable house owners to secure a low rate when using a large volume of gas through their gas furnaces or stoves.

and came East recently to take charge of the Consolidated Gas Company.

The formal transfer of the Coast Gas properties took place in the offices of the New York Trust Company, New York. The transfer added to Jersey Central Power and Light Corporation gas holding properties which provide a system serving the territory from Atlantic Highlands to Ocean City and inland to Lakewood.

Officers of Jersey Central Power and Light Corporation and of the General Engineering and Management Corporation, the organization of engineers and accountants which operate Jersey Central properties, took charge of the offices throughout the territory served.

Gas Rate Boosted

The Kane Gas, Light and Heating Company has issued notices to its consumers that, effective August 1, 1924, the rate to domestic users will be raised from 47 cents per 1,000 feet, with 2 cents discount if bills are paid on or before the 15th of the month, to 52 cents per 1,000 feet, with 2 cents off if bills are paid before the 15th of the month.

New Coal Gas Plant to Be Built at Lynn, Mass.

The Lynn Gas and Electric Company, Lynn, Mass., has placed an order with the Koppers Company for a coal gas plant to have a capacity of approximately 2,000,000 cubic feet of coal gas per day. The plant will consist of eleven 6.8 ton capacity Koppers gas ovens and two 7-foot Koppers producers, together with the necessary coal and coke handling equipment.

Gas Customers Praise Company

Ferndale, Mich.—Prominent citizens of Royal Oak City were interviewed in regard to gas service rendered by the Consumers Power Company at Royal Oak.

C. B. Edwards, of the First State Bank: "If the people of Ferndale are wise they will work hard to secure a gas franchise from the Consumers Power Company. Securing of gas will be a great asset in the further growth of Ferndale, and the Consumers Power Company is fully able since installing the new tank and equipment in Royal Oak City to supply all the gas needs of Ferndale for years to come. The company is always courteous and ready to respond to the needs of their customers. Ferndale should get out and boost for the franchise."

Dan Mason, who runs the big and finest restaurant in Oakland county, said: "Have no kick coming on the gas supplied by the Consumers Power Company. It is always in good shape and ready for whatever demands are made upon it. Also the company is anxious to please and ready to respond when asked by customers."

L. A. Gifford, of the Gifford Lumber Company: "Have been in business in Royal Oak about ten years, and if there is any kick about the gas supplied by the Consumers Power Company at this time would soon hear about it. I believe Ferndale would be wise in voting for the franchise."

Gas Co. Aids in Fight on Cotton Pests

Greenville, Texas—In an effort to be of service and aid in the fight launched by Hunt county farmers and business men to save the 1924 cotton crop from the ravages of grasshoppers and other pests, L. K. Wise, manager of the Greenville Gas and Fuel Company, announced that his company will furnish free of charge, including instructions on how to use any quantity of the M. C. disinfectant manufactured by the local company.

"The disinfectant, if used properly and according to instructions, will positively not only halt the ravages of the hoppers but will kill them," Mr. Wise declared. Continuing, he said: "The disinfectant if spread around the field will keep the pests away and if sprayed in a field where they have already made an invasion it will kill them.

Mixed Gas Will Relieve Winter Shortage

Tarentum, Pa.—Proposed acquisition of the Altoona Gas Light and Fuel Company's' artificial gas plant by the People's Natural Gas Company is declared by officials of the latter company to be the forerunner of a program of ultimately supplying consumers with a mixture of the manufactured and natural fuels.

Capital Stock of Gas Co. Increased

Albany, N. Y.—Certificate has been filed in the office of the Secretary of State at Albany increasing the capital stock of the People's Gas Company of Oswego, N. Y., from $1,300,000 to $2,000,000 and from 26,000 shares to 40,000 of $50 par value.

New Rates for Mountain Gas Co.

Albany, N. Y.—A new schedule of rates to be charged by the Mountain Gas Company, Inc., operating in Saranac Lake, was approved recently by the Public Service Commission. The new rates will become effective August 1. The order of May 29 suspending the new tariff first proposed by the company is vacated.

The rates approved are as follows:

For the first 3,000 cubic feet of gas consumed per month, at $5.15 per 1,000 cubic feet; for the next 7,000 cubic feet of gas consumed per month, at $3 per 1,000 cubic feet; for all gas consumed per month in excess of 10,000 cubic feet, at $2.15 per 1,000 cubic feet.

It is provided that if a bill is paid within ten days after its date a discount of 15 cents per 1,000 cubic feet will be allowed. In its original tariff the company proposed a discount of 15 cents a thousand for the first 3,000 cubic feet; 30 cents for 3,000 cubic feet to 10,000 cubic feet and $1.15 a thousand for all gas sold over 10,000 cubic feet. The Commission held that the practice contemplated tended toward discrimination.

The new schedule provides that meters will be closed on the 16th of the month if bills for the previous month are not paid.

More Than Eight Billion Cubic Feet of Gas Used Yearly in the Bronx

Bronx, N. Y.—Aside from the kind used by some politicians and stock salesmen, the residents of the Bronx and the various manufacturing concerns used at least 8,000,

000,000 cubic feet of gas a year for lighting, cooking, heating and industrial purposes, according to figures given out by Louis H. Werner, vice-president of the Central Union Gas Company, 148th street and Courtlandt avenue.

During the fiscal year 1923, the Central Union Gas Company furnished 3,317,049,100 cubic feet of gas to its patrons in the Bronx.

The rest of the Bronx is supplied chiefly by the Northern Union Gas Company, and therefore it is a safe estimate to say that the amount of illuminating gas used in the Bronx reaches eight billion cubic feet a year.

The results of the company's efforts to spread the use of gas to other fields besides lighting, and also some idea of the growth of the Bronx in population can be gained by the figure for 1913, which is 2,521,795,900 cubic feet, an increase of almost a billion cubic feet inside of five years.

Then the company's figures for 1923, showing almost three and a half billion cubic feet of gas used, an increase of another billion over the 1913 figure, is still an added indication of the tremendous growth that the use of gas has enjoyed.

"By our persistent campaign," Werner declared, "we have convinced the residents of the Bronx of the great convenience of gas as a cooking and heating agent.

"The old coal fire for cooking and heating has come into practical discard. Gas can be turned on and off at will, is a great time saver, and, from the housewife's point of view, is a great labor saver, in which ashes are eliminated."

Among the manufacturing firms in the Bronx that use gas for industrial purposes, Werner cited the Ward Baking Company, whose ovens are heated entirely by gas.

The Ullman Ink Company and the Hill-Ware Bakery are other Bronx concerns that use gas in making their products.

According to Werner, these firms, by a sliding rate scale, find gas cheaper than coal for the purpose.

When asked if the increasing use of electricity has hurt the gas business, Werner replied in the negative.

"It is true," he said, "that due to the convenience, many people prefer electricity for lighting purposes. However, only 20 per cent of the gas we manufacture is used for lighting purposes, the rest being devoted to cooking, heating and industrial purposes.

As far as fields outside of lighting are concerned, I believe it will be some time before electricity will be a real factor."

Regarding the relative value of electric and gas light, Werner quoted an article in the Scientific American which said that the gas light was the nearest thing to daylight and diffuses more light than the electric bulb.

Largest Gas Meter in the World at Wembley

The largest gas meter in the world is on display at the British Empire Exhibition at Wembley, London. It is 12 feet high and 13 feet dep. Sixteen inch pipes feed the meter, which takes in 50,000 cubic feet an hour.

Thirteen miles of gas mains extend from the meter to supply service for many different processes, from rivet-heating to candy-making.

On the exhibition grounds are 54 restaurants, in which all the cooking is done with gas. They consume 2,000,000 cubic feet a week, or enough to supply a community of 20,000 people. Five thousand gas lamps illuminate the main amusement park.

Announcement of Annual Convention of Pacific Coast Gas Association

The thirty-first annual convention of the Pacific Coast Gas Association will be held at Santa Barbara, California, September 15 to 19, 1924, with headquarters at the Arlington Hotel.

Due to limited amount of exhibit and demonstration space, it is planned to reserve it for the use of new and interesting accessory equipment of gas, its raw materials and by-products.

Formal Transfer of Gas Concerns

Asbury Park, N. J.—The Coast Gas companies have formally passed from the control of Martin Maloney to the Jersey Central Power and Light Corporation and the new ownership is in charge of the properties.

A. E. Fitkin, president of the Jersey Central Power and Light Corporation, became president of the Coast Gas Company and its subsidiaries, and Ralph J. Ritchie, a vice-president of Jersey Central, became vice-president and general manager. Mr. Ritchie has been identified with western public properties controlled by Mr. Fitkin

Eliminating "Dead" Corporations

Albany, N. Y.—Under the terms of a law passed by the New York State Legislature in 1922, the intent of which was to eliminate from the records of the corporation bureau in the office of the Secretary of State at Albany, the several thousand "dead" corporations over 25 years of age, every stock corporation formed before January 1, 1898, except corporations which had paid a franchise tax subsequent to January 1, 1919, a corporation formed by special act and a banking, insurance, transportation or railroad corporation, was required to file a certificate with the Secretary of State before December 31, 1922, showing that it was still alive.

December 31, 1923, the Secretary of State sent a list to the Governor of all corporations in such category which had failed to file the certificate, the Governor issued a proclamation, in April of this year the names were published in a paper in the county in which organized, and the three months' time has now expired during which any of such declared "dead" could, on payment of a fee of $25, be reinstated as live corporations.

Due to the method employed and the manner of publication, it is altogether probable that a goodly number of going corporations have been listed for dissolution and that legal steps may be necessary not only to retain their corporate existence, but to prevent another new corporation being formed and taking on their name.

New Contracts

The U. G. I. Contracting Company has just received contract from the Lima Gas Light Company, Lima, Ohio, for a complete 9-foot set of carburetted water gas

apparatus, 150 HP. water tube boiler and feedwater heater, tar extractor, tar separator and filter, including all foundation work.

The New York and Queens Gas Company has recently contracted with the U. G. I. Contracting Company for the installation of an additional 9-foot set at their plant at Flushing, N. Y., in order to take care of the increased demands on their plant.

New 10-375 Meter Announced

The Lambert Meter Company, Brooklyn, N. Y., announces a new meter which they call the 10-375 meter. The outstanding characteristics of this meter are that it is so constructed that it may be called "a high capacity slow motion meter." To accomplish this the Lambert 10-375 meter operates on four revolutions to the cubic foot. It is built with a valve grating or seat containing a central rib which overcomes whistling, and valve cover having a monel metal top which is both noncorrodable and indestructible. The valve arms are made out of solid monel metal, absolutely doing away with the possibility of the holes in the arms becoming oval in shape, due to wear.

The rock shaft bracket contains two solid brass inserted feet connected by a steel rod around which the white metal bearings are poured. This prevents melting away of the feet when the bracket is soldered to or unsoldered from the diaphragm disc. The inlet and outlet pipes are of solid bronze and are riveted to each side in six places. They are made either in half length or full length size. The diaphragms are of the non-touching type and are interchangeable and standard in size.

Gas Co. Petitions to Issue Bonds

Indianapolis, Ind.—The Citizens Gas Company has asked the Public Service Commission for authority to issue $68,000 of its bonds and a permit to take $67,000 of the bonds of the Indianapolis Gas Company. The petition states the money to be derived from the sale of the bonds is for the purpose of reimbursing the treasury of the company and to pay for additions and betterments made in the property.

Troy Firm Will Supply Gas for A. P. and L. Corp.

Schenectady, N. Y.—Schenectady will receive its gas supply from Troy under a plan recently completed by the Adirondack Power and Light Corporation, whereby that corporation has agreed to purchase gas from the Troy Coke and Iron Company and bring it to this city through a 12-inch high pressure main, 15 miles in length. It is predicted that the system will be complete and the city receiving its gas from Troy by the middle of next summer.

Under the sale for the first year the Troy company will sell the Adirondack about 1,000,000,000 cubic feet. The gas coming from Troy will be fed into the local system of mains.

A steadily decreasing supply of fuel oil is chiefly responsible for the centralization of production, officials said. Coal gas production is expected to solve this trouble and the local corporation deemed it advisable to procure its supply from the firm with which it had been negotiating for several years.

As long ago as six years reports were current that the city would procure its supply from some plant which was rumored as being designed for an island in the Hudson River between Albany and Troy. This plant, according to the report, would have supplied gas to this district under a plan somewhat similar to the present electrical tie-in system used between transmission lines of this state.

Though nothing actually developed at the time to bear out the rumor, indications are that the announced Troy supply for this city is an outgrowth of the study made at that time.

The Broadway plant will not act alone as a distributing station for the gas received here. tIs generating equipment will be held in reserve, so that in the event of failure of supply through the 12-inch Troy main, the Broadway station can be placed in operation to furnish the city with gas. This city will receive about 3,000,000 cubic feet of gas for each 24 hours.

Many Meter Changes in Detroit

Detroit, Mich.—Detroit is a restless city, if the records of the Detroit City Gas Company on meter changes are an indication. In 1923, according to figures just released, 129,615 meters were turned off and others turned on by the service department, out of approximately 265,000 consumers. Spring and fall are given as the restless ages. An idea of the organization necessary to meet this single item of public service may be gained when it is stated that all requests received by the Detroit company up to the middle of the morning are cared for the same day.

Gas Co. Building Large Office Building

New York, N. Y.—One of the largest business buildings to be erected in the Bronx has been begun by the Northern Union Gas Company at 304 to 312 East Kingsbridge road, between East Fordham road and Valentine avenue. It will be five stories with a foundation for ten more stories. The estimated cost is $600,000. The plans are by Jardine, Hill & Murdock, architects. The facade will be a modern adaptation of the late Georgian period, built of South Dover marble for the first story, with terra cotta trimmings. The ground floor will be devoted to show or display rooms of the Northern Union Gas Company and the United Electric Light & Power Company. A mezzanine will be provided for the display of appliances. The second floor will be given over to executive offices and the bookkeeping and general business offices of the Northern Union Gas Company.

P. C. G. A. Moves Into New Offices and Appoints Asst. Secy.

The June "Monthly Message" of the P. C. G. A. announces that the association has moved to new quarters in the Wells Fargo building, room 19, and that Clifford Johnstone, assistant secretary, will be in charge. The following is what the "Monthly Message" says about Mr. Johnstone, who assumed his duties June 1: "He is a civil engineer by education, was a hydraulic engineer by choice, then an editor of a trade journal by necessity, next associated with Henry Ford, for no reason, and then an aviator during the war, for a good reason, last a member of the engineering staff, California Rail-